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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/709,206 | 11/09/2000 | Paul A. Charpentier | 5051-478 | 2591 |

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| EXAMINER | |
|---|---|
| TESKIN, FRED M | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1713 | 8 |

DATE MAILED: 12/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

cl 0 8

# Office Action Summary

| Application No. | Applicant(s) |
|---|---|
| 09/706,206 | Charpentier, et al. |
| **Examiner** | **Art Unit** |
| Fred Teskin | 1713 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *THREE (3)* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on *Nov 3, 2003* .

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) *1-68* is/are pending in the application.

4a) Of the above, claim(s) *19-32 and 53-68* is/are withdrawn from consideration.

5) ☒ Claim(s) *33-52* is/are allowed.

6) ☒ Claim(s) *1-6 and 10-18* is/are rejected.

7) ☒ Claim(s) *7-9* is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☒ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). *3, 5*
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1. Applicants' election without traverse of the invention of Group I, claims 1-18 and 33-52, in paper no. 7 is acknowledged.

2. Claims 19-32 and 53-68 stand withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Election was made **without** traverse in paper no. 7.

3. The disclosure is objected to because of the following informalities: the specification at page 10, lines 20-22 refers to a copending U.S. application the content of which is said to be "incorporated herein by reference in its entirety". The present status of the copending application should be made known to the examiner. In addition, applicants are reminded that incorporation by reference of *essential* material is proper only for U.S. patents and allowed applications, MPEP 608.01(p)(B), and are requested to clarify whether material disclosed in the referenced application is essential to the instant claims within the meaning of § 112, 1st paragraph. If so, such material should be added by amendment directly into the text of the specification. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating

that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 103© and potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103(a).

5. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-6 and 10-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Charpentier et al (*Macromolecules*, 1999 Sep. 7, 32(18): 5973-5975)("Charpentier").

Charpentier describes a continuous process for the heterogeneous polymerization of various monomers in supercritical $CO_2$, using an experimental system including an intensely mixed CSTR and two high-pressure filters for separating and collecting the polymer produced (see page 5973, final full paragraph of left-hand column and page 5974, Figure 1). Reactor conditions for the polymerization of vinylidene fluoride using diethyl peroxydicarbonate initiator and polymerization results and polymer characterization data are given in Tables 1 and 2.

Charpentier is seen to disclose substantially the same method as here claimed but for the "returning" step, i.e., step (e) as recited in claim 1.

In regard to this step, however, it is firstly noted that Charpentier explicitly suggests returning monomer and supercritical $CO_2$ to the reaction vessel: "continuous removal of polymer from the system and recycling of monomer and supercritical fluid should be facilitated in a continuous system" (page 5973, second paragraph of left-hand column, third sentence). Economic considerations alone

would have provided ample incentive for one of ordinary skill in the art to implement the suggested recycling step by returning the reactor effluent stream, containing monomer and supercritical fluid, to the CSTR vessel of Charpentier following passage through the separation filters.

Further, as to the pressure at which the effluent stream is maintained during the returning step, Charpentier recognizes that the pressure drop of the supercritical fluid/monomer mixture should be *minimized* in order to minimize the energy required to recompress the mixture for recycle (see page 5975, first full paragraph of right-hand column). In other words, Charpentier recognizes pressure drop of the supercritical fluid/monomer mixture as a result effective variable directly affecting the energy required to recompress the mixture for recycle.

Accordingly, one of ordinary skill would have been led to ascertain the optimum pressure drop needed to achieve a desired reduction in recompression energy through routine experimentation. Discovery of an optimum value for an art-recognized result effective variable in a known process is ordinarily within the skill of the art, *In re Boesch*, 205 USPQ 215, 219 (CCPA 1980).

Thus, it would have been obvious to one of ordinary skill in the art to modify the continuous process of Charpentier by

recycling the effluent stream to the CSTR while maintaining that stream at a pressure not more than about 100 psi less than the pressure in the reactor, as claimed, motivated by a reasonable expectation of minimizing the energy required to recompress the stream prior to return to the reaction vessel.

7. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Hergeth et al is pertinent to the dispersion polymerization of ethylenically unsaturated monomers in liquid or supercritical carbon dioxide.

Brothers is pertinent to the polymerization of vinylidene fluoride in a dispersion medium comprising $CO_2$, using an azo initiator.

Fukui et al is generally pertinent to the polymerization of vinyl monomers in liquid $CO_2$ under super atmospheric pressure.

8. Claims 33-52 are allowable over the prior art of record. As of the date of this Office action, examiner has not located or identified any prior art document(s) that can be used to render the method defined by said claims anticipated or obvious to a person having ordinary skill in the art.

9. Claims 7-9 are objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claim.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner F. M. Teskin whose telephone number is (703) 308-2456. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (703) 308-2450. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

FRED TESKIN
PRIMARY EXAMINER
1713

FMTeskin/12-02-03